

Compression Test Kit

Model 39224

ASSEMBLY AND OPERATING INSTRUCTIONS



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For technical questions and replacement parts, please call 1-800-444-3353

Specifications

Application	Gasoline Engines *
Gauge	3" diameter
Hose	14" Vinyl

Adapters Included	14mm & 18mm
Dual Scale Dial	0-300lbs. & 0-21kg.
Carrying Case	Fitted, molded plastic

* Checks valve and rings, detects excessive carbon and late timing in gasoline engines.

WARNING: Not for use in diesel engines.

Save This Manual

You will need the manual for the safety warnings and precautions, assembly instructions, operating and maintenance procedures, parts list and diagram. Keep your invoice with this manual. Write the invoice number on the inside of the front cover. Keep the manual and invoice in a safe and dry place for future reference.

Safety Warnings and Precautions

WARNING: When using tool, basic safety precautions should always be followed to reduce the risk of personal injury and damage to equipment.

Read all instructions before using this tool!

1. **Keep work area clean.** Cluttered areas invite injuries.
2. **Observe work area conditions.** Do not use machines or power tools in damp or wet locations. Don't expose to rain. Keep work area well lighted. Do not use electrically powered tools in the presence of flammable gases or liquids. Be aware of the inherent dangers of working on a gasoline engine.
3. **Keep children away.** Children must never be allowed in the work area. Do not let them handle machines, tools, or extension cords.
4. **Store idle equipment.** When not in use, tools must be stored in a dry location to inhibit rust. Always lock up tools and keep out of reach of children.
5. **Use the right tool for the job.** This compression tester is intended for use in gasoline powered engines. Do not use this tester on diesel engines, as the higher compression developed by diesel engines may damage the tester. Do not modify this tool and do not use this tool for a purpose for which it was not intended.
6. **Dress properly.** Do not wear loose clothing or jewelry as they can be caught in moving parts. Protective, electrically non-conductive clothes and non-skid footwear are recommended when working. Wear restrictive hair covering to contain long hair.

7. **Use eye and ear protection.** Always wear ANSI approved impact safety goggles when working on gasoline engines. Be sure to work in a well ventilated place, or pipe exhaust gasses to the outdoors. **Carbon Monoxide Warning: Guard against exposure to Carbon Monoxide, which is an odorless, colorless gas produced by gasoline engines. Carbon Monoxide exposure may cause serious injury or death.**
8. **Do not overreach.** Keep proper footing and balance at all times. Do not reach over or across running machines.
9. **Maintain tools with care.** Keep tester threads sharp and clean for better and safer performance. Follow instructions for lubricating and changing accessories. The gauge hose and adapters must be kept clean, dry, and free from oil and grease at all times.
10. **Stay alert.** Watch what you are doing, use common sense. Do not operate any tool when you are tired.
11. **Check for damaged parts.** Before using any tool, any part that appears damaged should be carefully checked to determine that it will operate properly and perform its intended function. Any part that is damaged should be properly repaired or replaced by a qualified technician. Do not use the tester if it leaks or the pressure release valve does not function properly.
12. **Replacement parts and accessories.** When servicing, use only identical replacement parts. Use of any other parts will void the warranty.
13. **Do not operate tool if under the influence of alcohol or drugs.** Read warning labels on prescriptions to determine if your judgment or reflexes are impaired while taking drugs. If there is any doubt, do not operate the tool.
14. **Maintenance.** For your safety, service and maintenance should be performed regularly by a qualified technician.
15. **WARNING:** Wear protective gloves and ANSI approved eye protection when working on a hot engine. Keep hands away from the fan and other moving parts, and protect yourself from electrical shock or burns. Be aware that working on a gasoline engine is inherently dangerous, and suitable precautions must be taken.

Warning: The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

Unpacking

When unpacking, check to make sure the following parts are included.

Compression Gauge with Quick Release Chuck Molded Plastic Case
14" Vinyl Hose Extension Aluminum Tube
Extension Thread Head Angled Extension Aluminum Tube

If any parts are missing or broken, please call Harbor Freight Tools at the number on the cover of this manual.

Operation

A compression tester can give you valuable information about the engine's top end (pistons, rings, valves and gaskets).

If you are not experienced in doing this type of diagnostic test, the work should be done by a qualified technician.

NOTE: The engine must be at normal operating temperature, and the battery must be at full charge to develop correct readings. **WARNING:** Wear protective gloves and ANSI approved eye protection when working on a hot engine. Keep hands away from the fan and other moving parts, and protect yourself from electrical shock or burns. Be aware that working on a gasoline engine is inherently dangerous, and suitable precautions must be taken.

1. Clean the area around the spark plugs using compressed air. It is important to prevent foreign materials from falling into the cylinders once the spark plugs are removed.
2. On engines with a single plug per cylinder, remove all spark plugs. Note the position of the wires so that the correct wire may be replaced on each plug at the end of the job. On engines with two spark plugs per cylinder, remove only one plug per cylinder.
3. Block the throttle linkage in the wide open position.
4. Disable the ignition system. On distributor ignitions, remove the coil wire from the distributor. On electronic ignitions, remove the connector from the coil pack.
5. For fuel injected vehicles, or vehicles with an electric fuel pump, disable the fuel pump circuit. This may easily be done by removing the fuse for the fuel pump.
6. Install the compression gauge in the number one spark plug hole. You may want to use any of the supplied adapters. The gauge attaches and removes using a quick-release chuck. Be sure the installation is secure and pressure tight.

7. Crank the engine over several compression strokes and watch the gauge. On a healthy engine, the compression will build up quickly. Low compression on the first stroke followed by a slow build up of pressure indicates worn piston rings. Low compression which does not build up indicates leaking valves, a blown head gasket or cracked head. Carbon deposits on the valves can also cause low pressure. Record the highest compression obtained.
8. Repeat this procedure for each of the remaining cylinders and record the results.
9. On a low compression engine, add approx. 1/4 oz. motor oil to each cylinder through the spark plug hole and repeat the procedure.
10. On a low compression engine, if the compression increases after the oil has been added, worn rings are definitely indicated. If the compression doesn't increase significantly, the leakage is occurring at the valves or head gasket (or cracked head).
11. If compression is low in two adjacent cylinders, it is likely that the cylinder head between them is leaking. If coolant is found in the combustion chambers or crankcase, this possibility is confirmed.
12. If the compression on one cylinder is 20% or so lower than the others, and the engine has a rough idle, it is likely that the valve is stuck or the camshaft has a worn lobe.
13. If the compression is unusually high compared to the engine specifications, it is likely that the cylinders are carbonized. A qualified mechanic should remove the engine head and remove the carbon.
14. If the compression varies greatly (over 15%) from the highest compression cylinder to the lowest, or the average compression is significantly lower than the specification, the engine should be looked at by a professional for a leak-down test or other service to identify and repair the problem.



Maintenance

Very little maintenance of this tool is required. Keep this tool clean and free from dirt, grease or grit. Store it in its case when not in use. Periodically check the threads for damage. Release the pressure from the gauge before storing.

Note: Replacement parts are not available.